TENNESSEE DEPARTMENT OF EDUCATION

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Programming and Logic II

Primary Career Cluster:	Information Technology
Consultant:	Bethany King Wilkes, (615) 532-2844, Bethany.Wilkes@tn.gov
Course Code(s):	6099
Recommended Prerequisite(s):	Algebra I (3102), Programming and Logic I (6098)
Credit:	1
Grade Level:	11-12
Aligned Student Organization(s):	Skills USA: www.tnskillsusa.com Brandon Hudson, (615) 532-2804, Brandon.Hudson@tn.gov Technology Student Association (TSA): www.tntsa.org Amanda Hodges, (615) 532-6270, Amanda.Hodges@tn.gov
Teacher Resources:	http://www.tn.gov/education/cte/InformationTechnology.shtml

Course Description

Programming and Logic II is a course in which students will develop advanced skills in problem analysis, construction of algorithms, and computer implementation of algorithms as they work on programming projects of increasing complexity. The recommended programming environment is *Visual Studio*; it permits an emphasis on development of analytic skills using a particular language syntax or vocabulary. Emphasis is on actual programming projects, both individual and group. Course content should be repeatedly applied to increasingly complex projects. Advanced topics using DirectX, AI, C#, and Java are planned.

Course Standards

Standard 1.0

Students will demonstrate leadership, citizenship, and teamwork skills required for success in the school, community, and workplace.

The student will:

1.1 Exhibit positive leadership skills.

1.2 Participate in SkillsUSA as an integral part of classroom instruction.

1.3 Assess situations and apply problem-solving and decision-making skills to particular client relations in the community, and workplace.

1.4 Demonstrate the ability to work cooperatively with others in a professional setting.

Sample Performance Tasks

- Create a leadership inventory and use it to conduct a personal assessment.

<u>Standard 2.0</u>

Students will perform safety examinations and maintain safety records.

The student will:

2.1 Pass with 100% accuracy a written examination relating specifically to safety issues.
2.2 Pass with 100% accuracy a performance examination relating specifically to industry tools and equipment.
2.3 Maintain a portfolio record of written safety examinations and equipment examinations for which the student has passed an operational checkout by the instructor.
2.4 Explore and implement ergonomic procedures required for the IT industry.

<u>Standard 3.0</u>

Students will analyze programming for game developers.

The student will:

3.1 Explore the development process
3.2 Explore the roles of team members in game development

Sample Performance Task

- Student as individuals or groups, create a developmental programming project taking on specific team roles. A typical project might be developing a new application for the school system that automates a manual process.

<u>Standard 4.0</u>

Students will design and build programs for gaming systems.

The student will:

4.1 Design and build increasingly complex games individually and in teams.
4.2 Analyze problems and design, build and test software systems in a team environment using industry-standard software engineering processes encompassing all phases of the software lifecycle to solve them.
4.3 Demonstrate the ability to choose the most appropriate programming languages, standards and technologies to meet the requirements of specific projects and communicate these decisions clearly in written and oral forms.

Sample Performance Task

- ➢ Students as individuals and in groups, given a written problem statement, analyze the problem and prepare written descriptions (algorithms) of the process to solve it. The students will write program code that meets the statement requirements. A typical problem might be a first person adventure or simulation.

Standard 5.0

Students will explore graphics programming using DirectX.

Students will:

5.1 Evaluate and create Visual Basic and C++ applications using DirectX.
5.2 Analyze bitmaps, sprites, animation, DirectDraw, and sound using DirectX.
5.3 Examine and build artificial intelligence into applications and game design.

Sample Performance Tasks

- ➢ Students experiment with computer processes and features (e.g., arithmetic operations, data structures, conditional tests) that will implement algorithms to solve problems.
- ➢ Students make use of iterative and/or recursive processes to expedite algorithms.

Standard 6.0

Students will explore texture lighting and shading.

Students will:

6.1 Learn techniques of lighting and using textures to enhance the application.
6.2 Evaluate the advanced shading and texturing techniques that can bring realism or depth to surfaces.
6.3 Determine the resources needed when building textures and lighting that require a tradeoff during the design process

Sample Performance Task

- ➢ Students construct computer instructions that avoid complications caused by the limited range and precision of numbers used by the computer.

Standard 7.0

Students will implement sound effects and music into game programming.

Students will:

7.1 Program ambient sound, music and 3-D using the DirectX audio APIs.

Sample Performance Task

- Students work in their developmental teams to implement sound and music into the program.

Standard 8.0

Students will explore game program compilers and creating standalone applications.

The student will:

8.1 Evaluate the program created by the application’s compiler and creates standalone applications that allow the programs release to the public.

Standard 9.0

Students will evaluate computer instructions to resolve logical and user errors before the program is released.

The student will:

9.1 Create “good” code and evaluate improper coding using best practice methods.

9.2 Evaluate the formal testing process that is required in order to correct programming errors.

9.3 Develop the necessary phases of program testing, including post-production and final release.

Course Resources

How to Design Programs: An Introduction to Programming and Computing. MIT Press Edition, January 2001. Available free online at http://www.htdp.org/2001-01-18/Book.

Visual Basic Game Programming with DirectX. Premier Press Edition, 2002.

DarkBasic Pro Game Programming, 2nd edition, Thompson-Course Technology 2007.